USE OF RFID IN NASSDOC AND BCL, DELHI: A COMPARATIVE STUDY

DISSERTATION

Submitted in partial fulfillment of the requirements for the award of the degree of

Master of Library

&

Information Science

(2009-10)

By

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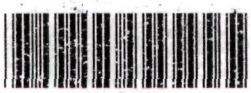
ALIGARH (INDIA)

2009-2010



Dedicated

To

My

Loving

Family

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE
ALIGARH MUSLIM UNIVERSITY, ALIGARH

Mrs. Nishat Fatima
Senior Lecturer

Certificate

This is to certify that **Miss. Nausheen** has completed her dissertation entitled "Use of RFID in NASSSDOC and BCL, Delhi: a comparative study", in partial fulfillment of the requirements for the degree of **Master of Library and Information Science** (2009-10). She has conducted the work under my supervision and guidance.

I deem it fit for submission.

Mrs. Nishat Fatima
Senior Lecturer

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Nausheen

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INTRODUCTION

1.1. INTRODUCTION

RFID is a method of identifying items using radio waves. It is the reading of physical tags on single products, cases, pallets, or re-usable containers that emit radio signals to be picked up by reader devices. These devices and software must be supported by a sophisticated software architecture that enables the collection and distribution of location-based information in real time. The complete RFID technology of the tags and readers with access to global standardized data bases ensures real time access to up-to-date information about relevant products at any point in the supply chain.

RFID is one of the most exciting new library technologies. It is a means of identifying person or an object by using Radio Frequency (RF) transmission. These wireless automatic identification data capture system allow for non-contact reading or writing data, they are highly effective in manufacturing & other environments where bar-code labels cannot survive and to reduce workload by using Radio Frequency signals. This technology is used in circulation section to provide self-service and 24/7 access to library services, collections and other applications for some management purposes. It has been extensively used in applications such as tool collection, access control and ticketing.

It is used in library theft detection system which combines security with more efficient tracking of mate throughout library including easier faster charge & discharge, inventorying & mate handling.

1.2. HISTORY

36 years ago, in public library, the impact of technology on working environment was just in its infancy- bar code label and data reading devices "light pens" were just introduced. This was replacing a technology using card and paper which had been in use for well over 100 years in public libraries and now a technology which can read radio frequency tags through books cover to perform variety of actions in the form of RFID.

RFID is not a new technology but from RF tags we can trace early ancestors of modern day tag in the form of passive RF tag as far back as 1973. RFID tags were in operation with recorded use 15 years ago in US Department of Defence (DOD) according to wiki paedia.

In UK at least most libraries are still a long way behind for retail counterparts like Marks & Spencer's in applying RFID to stock movement. RFID stock management can allow us to access and manipulate information on how our stock is performing in a library and how our users get to know about what's new and what's happening in our libraries against their interests and user profile.

RFID from "cradle to grave" or from publication to disposal will undoubtedly replace barcode in the next 10 years. T is also hope of technology being used in future for inter-lending and the transfer of material between libraries and countries. In the 21st century library will operate with such simplicity that users will be able to check materials themselves and find what they want almost instantly-leaving library staff with more time to give personal attention to the users.

1.2.1. DECADES OF RFID

1940-1950	Radar refined and used in major World War to develop effort
1950-1960	Early explorations of RFID technology; lab experiments
1960-1970	Development of theory of RFID. Start of applications field trials.
1970-1980	Explosion of RFID development. Test of RFID accelerate. Very early adopter implementations of RFID.
1980-1990	Commercial applications of RFID enter mainstream.
1990-2000	Emergence of standards. Widely deployed. Becomes a part of everyday life.

1.3. RFID v/s BARCODE

S.No.	RFID	Bar Code
1	Line of sight not required	Line of sight required
2	Disintermediation	Mediated
3	Wide applications	Limited applications
4	Radio waves	Optical reader
5	Technology of the Future	Technology of the Past

1.4. DEFINITIONS

According to Babita Patanaik: "RFID is a generic term for technology that uses radio waves to automatically identify an object. There are three parts of RFID which are:

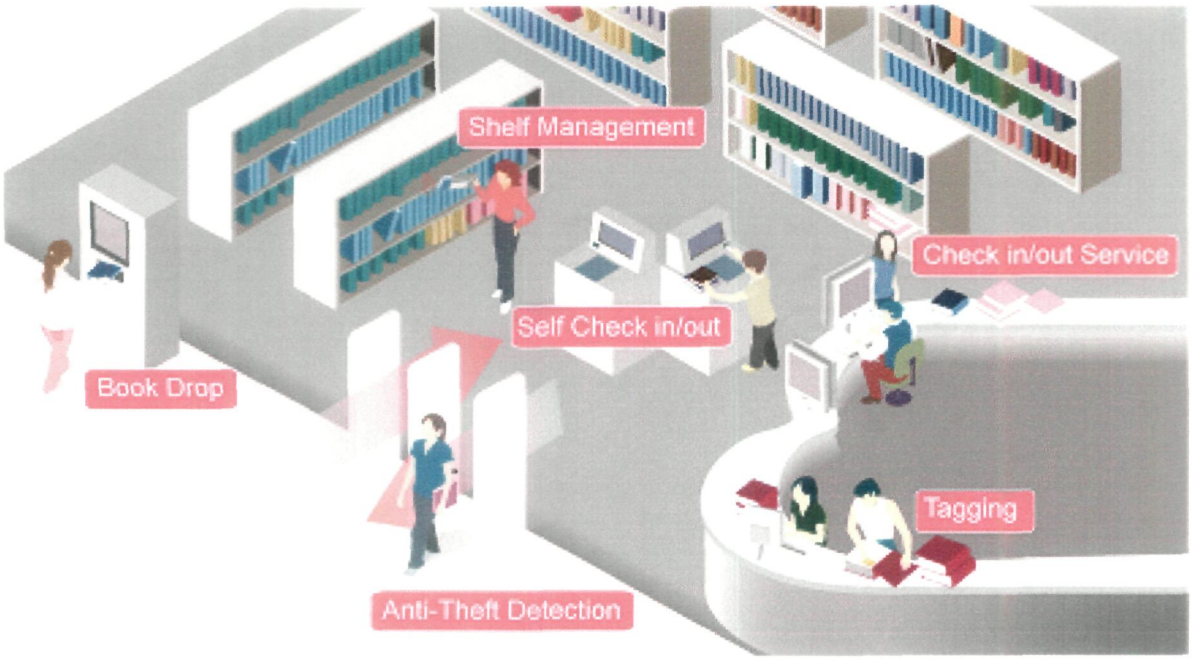
a. An Antenna: That enables the tag to send and receive data.

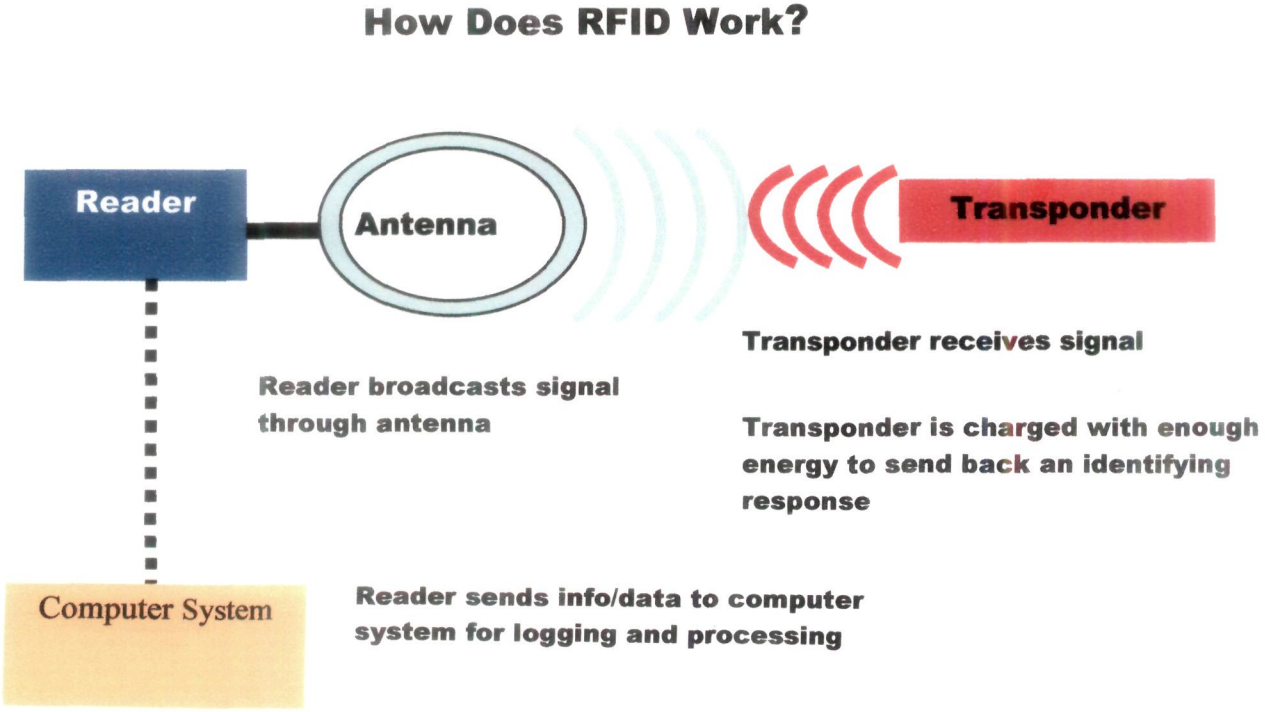
b. Transceiver/Reader: Also called Interrogator which holds digital information in a microchip used to transmit signal through antenna.

c. Transponder/Tag: A microchip attached to an antenna that picks up signals from and sends signals to a reader."

According to R.W. Boss "RFID is a combination of radio frequency based o microchip technology. Information contained on microchips in the tag affix to the library materials is read using Radio Frequency technology."

1.5. WORKING IN LIBRARY USING RFID TECHNOLOGY





1.6 COMPONENTS

1) RFID Tag or Transponder
2) Reader or Interrogator or Sensor
3) Image Sensor Gates
4) Antenna
5) Server

1) **RFID Tags:** An RFID tag is a tiny radio device that is also referred to as a transponder, smart tag, smart label, or radio barcode. The tag comprises a simple silicon microchip (typically less than half a millimeter in size) which stores bibliographic data including unique identification number to identify each item. This microchip is attached to an antenna that is packaged in a way that it can be applied to an object. It is thin, flexible and approximately 2"x2" in size which can be placed in each book. It is of two types: active and passive.

   Memory: More memory is not necessarily better than less it often relates with price and data speed.

   Functions: It can be read or write v/s read only. Some tags are "written to once". Once the tag is performed, the information stored in its memory can't be changed. Therefore information in it can be updated when required.

a) ***Active Tag:*** These tags are powered by an internal battery and are typically read or write means data can be rewritten or modified. An active tag's memory size varies according to application requirements some operate with up to 1 MB of memory.

b) ***Passive Tag:*** They operate without a separate external power source and obtain operating power generated from the reader. Passive Tag is much consequently much lighter, less expensive and offer unlimited operational lifetime than active tags. It contains a microchip with a capacity of 96 bits and is read or write.

Difference between Active Tag and Passive Tag		
	Active Tag	**Passive Tag**
Source of power	Built-in battery	Electromagnetic wave induction
Reaction distance	About 5-100 meters	Under 3 meters
Life	About 2-7 years	Up to 10 years
Weight	Heavier	Lighter
Size	Larger	Smaller
Technical Maturity	Lower	Higher

2. Reader: The reader/interrogator/scanner—sends and receives RF data to and from the tag via antennas. A reader may have multiple antennas that are responsible for sending and receiving radio waves.

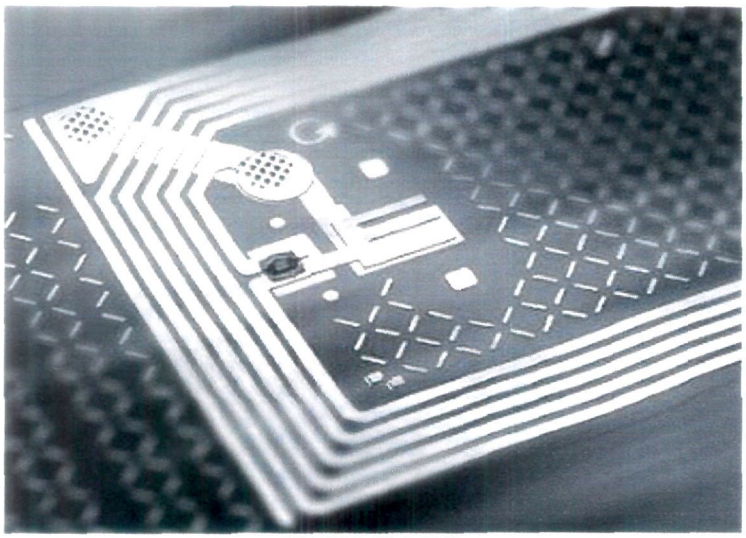
A typical system includes several different kinds of readers, also known as Sensors which are installed at Library exits. These sensors are of two types:

a) It reads the information on tags going by and connects that information to the server. The server after checking circulation database turns on an alarm if the material is not properly checked out.

b) It relies on "theft" byte in the tag that is turned on or off to show that item has been charged or not, making it necessary to communicate with circulation database. It is connected to computer, taking place of Bar Code Scanner.

4. Antenna: RFID Antenna is connected to reader, which has a size and structure that is determined by the distance for connecting and performing at a given stage. It is a conductive element enabling tag to send and receive data. Passive tags contain coiled antenna that couples with coiled antenna of the reader forming a magnetic field.

5. Server/ Docking Station: Server is the Heart of some comprehensive RFID system. It is the communication gateway among the various components. It receives information from one or more readers and exchanges information with the circulation database. A server costs as much as $15,000 more than two-third of which is the software.



RFID TAGS

READER OR SCANNER

IMAGE SENSOR GATES

1.7. RFID APPLICATIONS

1. Access control for people: There are many areas in which RFID tags are carried by people to allow them to gain access to facilities or services:

a. Secure access to work place
b. Safety access to dangerous/secure equipment
c. Access to a computer or vehicle
d. Access to travel on trains/buses
e. Access to leisure facilities

2. Access control for vehicles:

a. Secure access on site
b. Road tolling
c. Instant payment for fuel

3. Manufacturing automation:

a. Control of flexible manufacturing processes by recognizing items being built on a production line (mass customization enabler)
b. Labeling key components for later recycling

4. Logistics and distribution:

a. Tracking parcels from shipment to end customer
b. Tracking goods from manufacture to retail

5. Retail:

a. Supply chain management
b. Stock taking
c. Reducing loss through shrinkage
d. Reverse logistics
e. Product availability

6. Maintenance:

a. Plant & Equipment
b. Fixed assets
c. Patients

7. Product security:

a. Tamper evidence
b. Product authentication
c. Anti-counterfeiting

1.7.1. RFID APPLICATIONS IN LIBRARY

It supports tools to automate process and to improve operation management.

1. It reduces labor, eliminates human errors.
2. It puts a wealth of date at our finger tips.
3. The tags can be read through wood, plastic, cardboard and any other except material
4. The tags can be reprogrammed.
5. Patron self-check-in/check-out
6. Automatic book return
7. Conversion stations
8. Security system
9. Sorting stations

1.8. FEATURES OF RFID

1. Each pedestal is stand alone and plugs and play to the main power and does not require additional equipment.

2. It features an advanced digital signal processing technology and proves maximum detection speed and field, regardless of RFID tag.

3. Its security gates are made of two pedestals. Some additional can be added for increased detection surface.

4. Security gates need not to be linked to the library database and therefore they can still operate when the library network is overloaded.

5. Security system uses single RFID tag for identification and security as well as single piece of hardware equipment to offer an efficient, reliable and cost effective solution.

1.8.1. BANDS FOR RFID

Three primary frequency bands are being used for RFID:

- **Low Frequency** (125/134 KHz)—Most commonly used for access control, animal tracking, and asset tracking.
- **High-Frequency** (13.56 MHz)—Used where medium data rate and read ranges up to about 1.5 meters are acceptable. This frequency also has the advantage of not being susceptible to interference from the presence of water or metals.
- **Ultra High-Frequency** (850 MHz to 950 MHz)—offer the longest read ranges of up to approximately 3 meters and high reading speeds.

1.9. ADVANTAGES OF RFID

1)Rapid Charging and Discharging: The use of RFID reduces the amount of time required to perform circulation operations. The most significant time savings are attributable to the facts that information can be read from RFID tags much faster than barcodes and that several items in a stack can be read at the same time.

2)Scanning: RFID tracking system scan books on the shelves without taking them out or removing them. A hand held inventory recorder (scanner) can be moved rapidly across the shelf if books to collect all the unique identification information from the tags.

3)Simplified users self charging and discharging: For users using self charging, there is a marked improvement because they do not have to carefully place materials within a designated template and they can charge several items at the same time.

4)Automated Materials Handling: Another application of RFID technology is automated materials handling. This includes conveyer and sorting systems that can move library materials and sort them by category into separate bins or onto separate carts. This significantly reduces the amount of staff required to ready materials for re-shelving.

5)Long Tag Life: RFID tags last longer than Bar Codes because nothing comes into contact with them. Most RFID vendors claim a minimum of 100,000 transactions before a tag may need to be replaced.

1.10. DISADVANTAGES OF RFID

1. ***High cost:*** The major disadvantage of RFID technology is its cost. While the readers and sensors used to read the information comparable in cost to the components of a typical EM(Electromagnetic) or RF(Radio Frequency) theft detection system, typical $2,500 to $3,500 or more each; a server costing as much as $ 15,000 may be required and tags costing $.60 to $.85 each.

2. Vulnerability to comprise: It is possible to comprise an RFID system by wrapping the protected material in two or three layers of ordinary household foil to block the radio signal. It is possible to comprise an RFID system by placing two items against one another so that one tag overlays another. They may cancel out the signals.

3. Removal of exposed tags: 3M, which recommends EM for security and RID for tracking, argues that EM strips are concealed in the spines (30% of customers) of books and are

therefore difficult to find and remove while RFID tags are typically affixed to the inside back cover and are exposed for removal.

4. Exit sensor problems: Short range readers used for circulation charge and discharge and inventorying appear to read the tags 100% of time, the performance of exit sensors is more problematic. They must read tags up to twice the distance of other readers.

1.10. CONCLUSION

RFID tags provided with the characteristics of batch access, storage mass data, and the capability to be reprogrammed are better than barcodes and can help libraries accurately manage collections and extend their services.

Consequently, they currently have only limited applications in small libraries and only provide a few operations. RFID involves various techniques that over-exceed the ability of librarians and library factories. RFID will not attract attention if it is only used to replace the barcode.

Therefore, the first procedure to consider when applying RFID is to supply inventory, entrance guards, and gather reading statistics. RFID has the advantages of self check-in/out, theft detection, rapid inventory, and finding incorrectly shelved materials. Not only will RFID realize precise collections management, but will also achieve real-time services.

3.11. REFERENCES

1. Kataria, Sanjay and Nigam, B.S., Emerging trends and technologies: An overview of library and information services.

2. Aswal, R.S. (2006) *Library Automation for the 21st Century.* 216-217

3. Pattanaik, Babita and Patanaik, Bibhuti Bhusan (2008). RFID: An issue for Indian Libraries, *Libraries in Digital Environment: Problems and Prospects,* 284.

4. Sripriya, S. 2006) RFID Technologies for libraries in Digital Scenario. *Library Automation for the 21st century,* 271-273.

5. Singh, Vivek and Singh, Manisha (2009) Implementation of RFID system in Libraries. *Emerging Trends and Technologies in Library and Information Services,* 348.

6. Boss, R.W. (2003) RFID Technology for libraries [Monographs]. *Library Technology Reports.*

7. Singh, K.C. And Salek Chand (2009). RFID: A multifeudos Technology, *Emerging Trends and Technologies in Library and Information Science*, 356.

8. Mishra, R. N. And Panda, K.C. (2008) Perspective of library services with RFID Technology, *Libraries in Digital Environment*, 260.

9. Shien-Chang Yu (2007) RFID implementation and benefits in libraries, *the electronic library*, 25(1), 54-64.

10. Aswal, R.S. (2006) *Library Automation for the 21st Century.* 216-217

11. Mishra, R.N. and Panda, K.C. (2008). Perspective of Library services with RFID technology, *Libraries in Digital Environment: Problems and Prospects*, 261.

12. Sripriya, S. (2006) RFID Technologies for libraries in Digital Scenario, *Library Automation for the 21st century*, 274.

13. http://msdn.microsoft.com/canada/rfid/

CHAPTER-2

REVIEW OF RELATED LITERATURE

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REVIEW OF RELATED LITERATURE

2.1. NEED FOR LITERATURE REVIEW

Review of literature is very essential for a new research topic. The study of the related topic implies locating and reacting and evaluating reports of researchers as well as reports of the casual observation and opinion that are related to the individual planned research project. In any worthwhile study in the field of research, the research, the research must have an adequate knowledge with the work that has already been done in the area of his/her research. The researcher must have up to date information about what has been done in the area of his/her research.

In brief this chapter presents an overall review of studies conducted abroad as well as in India in chronological order regarding the topic. There are only those reviews which are similar to the present study.

2.1.1. Palmer, Martin. (2010) conducted study under the title ***"Making the Most of RFID in Libraries".*** This paper describes Radio frequency identification (RFID) is an old technology which has the potential to revolutionize many aspects of library service delivery. Martin Palmer's new book ***Making the Most of RFID in Libraries*** is a practical and straightforward book designed to help library managers decide whether to adopt RFID or not. If they do, Palmer advises them on how to make the most of the benefits RFID offers but he also on addresses the challenges that are inherent in RFID technology. He outlines the main elements to be considered when choosing an RFID system. Provides a general introduction to RFID and the background of RFID technology and how RFID works with existing library technology. This also addresses the issue of whether RFID provides an alternative method of accessing a library management system and whether libraries will need both. Palmer starts RFID in libraries by considering the various aspects RFID: such as staffing issues, the evaluation of different RFID systems and the management of the RFID project also receive attention. A RFID case study and a futuristic look at the role of RFID in libraries. *Making the Most of RFID in Libraries* is a very worthwhile investment for all those library professionals considering converting to RFID for their libraries, as well as for those who are implementing it already. The book

reads easily, has a very practical approach and is very much focused on how RFID can improve the library user's experience.

2.1.2. Ahsan Kamran and Shah, Hanifa (January 2010), conducted study under the title ***"RFID Applications: An Introductory and Exploratory Study".*** *This* paper describes that RFID is not a new technology and has passed through many decades of use in military, airline, library, security, healthcare, sports, animal farms and other areas. Industries use RFID for various applications such as personal/vehicle access control, departmental store security, equipment tracking, baggage, fast food establishments, logistics, etc. The enhancement in RFID technology has brought advantages that are related to resource optimization, increased efficiency within business processes, and enhanced customer care, overall improvements in business operations and healthcare. Our research is part of a big project; its aim is to produce a model for mobile technology implementation of hospital patients' movement process. However, the focus of this paper is to explore the main RFID components, i.e. the tag, antenna and reader. The results of the investigations conducted on the three RFID components will be used to develop our research model.

2.1.3. Nambiar, Arun N. (October 20-22, 2009) conducted under the study ***"RFID Technology: A Review of its Applications".*** This paper describes that Radio Frequency Identification (RFID) has a drastic increase in the number of applications and implementations in the recent years. The system facilitates automatic identification through a combination of *tags* and *readers*. The tags store and transmit data to readers using radio waves. The readers garner data from the different tags and relay them back to the server for further analysis and processing. The system serves the purposes of *identification*, *monitoring*, *authentication* and *alerting* through this exchange of data between the tag and the reader. The process is automatic. In other words, the RFID system facilitates remote and automatic identification. Today, RFID system has been successfully applied to the areas of manufacturing, supply chain, agriculture, transportation, healthcare, and services to name a few. Research in this area has been growing at a rapid pace as is evidenced by the number of articles published in the past couple years. This work aims to provide a review of the current developments in this field and to develop a taxonomic framework to classify literature which will facilitate quick content analysis and identify future direction of research. Cronin compares RFID with its

predecessor technology viz. barcodes. Barcodes require that the barcode and scanner are in direct line of sight for them to be scanned and the items have to be physically moved against the scanner for data collection. RFID tags, on the other hand, automatically transmit data to the reader even without a line of sight. RFID has been hailed as one of twenty-first century's greatest contributions. RFID implementations are increasing at an unbelievable rate with it making inroads into areas as diverse as supply chain, health-care, transportation etc.

2.1.4. Ghahri, Akbar and Nekoui, Mohammad Ali (2009), conducted study under the topic ***"Localization of Mobile Robots with RFID Technology and Expectation Maximization Algorithm"***. This paper describes a new way to localize mobile robots in a very noisy environment. The mobile robot is equipped with an active RFID reader and some tags are placed in the room to provide RF beacons in order that the robot can localize itself with the known tag geographical locations. The RFID equipment's are working in 916 MHz band and the tags are battery enabled so the range of the experiment can effectively increase to 50m. First there is a model estimated for the noise in the environment, which can be expressed as a Gaussians distribution then the RFID propagation model is obtained from a series of experimental tests. There are two different methods for data filtering. Kalman Filtering as the best ever used method and a new method of particle filters with expectation maximization core. The diversity and multipath effects in this experiment were considered as unwanted signal effects. The results show a good convergence in the EM method after very low iterators. The advantage of the EM method to Kalman filtering is not relying on the initial values. The precision of this new method in a normal environment is between 4-7cm in >10 iterations.

2.1.5. Manaher, Colleen (2008), conducted study under the topic ***"Use of Radio Frequency Identification (RFID) Technology for Border Crossings".*** This paper describes that U.S. Customs and Border Protection (CBP) employs Radio Frequency Identification (RFID) Technology that is to be used in cross border travel documents to facilitate the land border primary inspection process. A unique number is embedded in an RFID tag which, in turn, is embedded in each cross border travel document. At the border, the unique number is read wirelessly by CBP and then forwarded through a secured data circuit to back-end computer systems. The back-end systems use the unique number to retrieve personally identifiable information about the traveller. This

information is sent to the CBP Officer to assist in the authentication of the identity of the traveller and to facilitate the land border primary inspection process. Multiple border crossing programs use or plan to take advantage of CBP's vicinity RFID-reader enabled border crossing functionality including CBP's own trusted traveller programs, the pending Department of State's (DoS) Passport Card, the Mexican Border Crossing Card, the proposed Enhanced Driver's License (EDL) offered by various states, tribal enrolment cards that could be developed by various Native American Tribes, and the proposed Enhanced Driver's Licenses being developed within the various provincial authorities in Canada.

2.1.6. Shien-Chiang Yu (2008) conducted study under the title ***"Implementation of an innovative RFID application in libraries".*** This paper aims to consider how to extend RFID applications given the limited funds and budgets in libraries. RFID can replace barcodes and magnetic strips for security control and collections management. This research explains the implementation of the tag frequency, the construction of the multi-transceiver and existing TCP/IP network appliances. This study discusses issues and possible solutions in the process of implementing RFID applications for three innovative applications in library services. RFID technology has been applied in food circulating safety, health and medical treatment, home and public security, aviation ravel application, and trade channel safety. Libraries have implemented RFID applications in collection management, circulation services, and inventory operations to employ the functions of identification, rapid response and durability to enhance efficiency and accuracy. If the purpose of implementation of the replacing barcode by RFID which applies to shelving, circulation, inventory, and so on in library, these activities do not affect the original service models. Therefore, to apply RFID does not attempt libraries to do so. Now this has been the major purpose to replace traditional barcode and magnetic tape with wireless technology. During the routine of library operations, some situations may take place as follow: If patron takes an item from the collection without returning it to its original location, placing it in a wrong location, or on a different floor, these will bring trouble to library staff and later users. If the book's location can be shown in Online Public Access Cataloguing (OPAC), as well as the relative information of library collections which will be useful to library collection management. Circulation records can be stored in an automatic system for the statistics analysis purpose.

2.1.7. Yoshihara, Mariko (April 2007) conducted study under the title ***"RFID and Privacy"*** This paper describes that RFID technology is an automated system of wireless data capture, consisting of two parts: the tag (or transponder) and the reader. The privacy issues are particularly acute, as consumers can be unaware of the very presence of a tiny RFID tag as well as the fact that personal information can be transmitted at any time. Retailers are interested in RFID technology because it allows them to maintain constant and accurate inventory data at greatly reduced labour costs. In the commercial setting, RFID tags contain an Electronic Product Code (EPC) that can uniquely identify each and every tagged item. For the consumer, RFID tags can make the process of purchasing products faster and easier. Commercial RFID advocates envision the possibility of a grocery store where customers walk their carts through readers that instantly identify the products in the cart, compute the amount due, and charge RFID-enabled credit cards. Various federal agencies currently use RFID technology to track and identify sensitive objects such as radioactive material, shipments, or weapons. In addition, the federal government seeks to implement new electronic, RFID-embedded passports, which would link personal information electronically from individual passports to a central database. The federal government also recently tested a program that embeds RFID technology into the Arrival-Departure forms of travellers to the United States. With the expanding use of RFID tags in government-issued items like immigration forms, EZ Pass devices, and perhaps soon, all government-issued identification cards, privacy advocates fear the Big Brother possibilities these tags will create. Furthermore, there is the risk of theft of personal information by unauthorized readers, either by picking up the radio emissions from RFID tags or by accessing the centralized database of personal information.

2.1.8. Christiana, Joseph and Cirella, Nicholas (March 2, 2007) conducted under the study ***"Law Enforcement Response to Concerns Regarding RFID Technology"***. This paper describes that RFID technology must be our primary concern. It is the safety and security of the citizens under our protection. At the same time, while we enforce the laws we do not create those laws. The effort is on preventing new forms of theft that RFID could make possible, while ensuring that any employment of RFID technology on behalf will be done with the utmost respect for the rights and privacy of those we work to protect. Technology does not fundamentally change our mission to protect and serve. RFID technology is certainly an issue with which law enforcement in the future will have to contend. Such technology creates a whole new spectrum of possible criminal attacks on

an individual. Methods such as skimming, cloning and theft of RFID devices pose a property and information security risk that is different from any law enforcement has yet encountered. We would expect any vendors of RFID technology to employ appropriate crypto logical and hardware specific safeguards in order to ensure that their products are not easily vulnerable to such attacks. RFID technology may also play a role in aiding efforts to identify and apprehend criminals after they have committed a crime. The potential of RFID tags in aiding the identification of stolen property is an area that would greatly aid law enforcement. Further advances in RFID technology may help us combat crimes such as counterfeiting and even kidnapping, by allowing us to identify and locate items and individuals more quickly than ever before. While we will use any RFID technology to our advantage and work to prevent new avenues of theft created by such technology, we will not demand that items or individuals be fitted with any sort of RFID tags.

2.1.9. Palmer, *Martin (Nov10, 2006)* conducted study under the topic ***"Using RFID to transform Essex Libraries".*** This paper describes that Radio Frequency Identification (RFID) has, after a rather hesitant beginning, begun to take off fairly rapidly around the world. The author intended it to aid librarians in making decisions about whether or not to invest in this new technology. She is quite knowledgeable about the issue, and has written several other articles and reports for various journals. Ward surveyed the main providers of RFID technology, including Bibliotheca; Checkpoint Systems, Inc.; Vernon Library Supplies; VTLS; 3M. In addition, she provides basic information about RFID. She also looks at two of the reasons why more libraries aren't implementing RFID technology—cost and privacy issues. This article is especially useful for librarians considering investing in RFID because it has a chart with the specifications of the different vendors' systems. This chart provides quick and easy access to the basic information needed when considering RFID implementation. Ward concludes with contact information for the different vendors. This seems to be one of the best articles written about RFID technology in libraries. Ward explains the technology and what is offered by various vendors in enough detail to provide the basic information librarians need.

2.1.10. Shien-Chiang Yu (2006) conducted study under the title ***"RFID implementation and benefits in libraries".*** This paper describes that Radio frequency identification (RFID) applications that provide batch access, storage mass data and reprogramming are better than barcodes. The cost is one of the major factors influencing whether or not RFID will be accepted in libraries. Although RFID has improved the efficiency of libraries, the essence of the library service has not changed. To economize on the expense, the first step to consider is applying RFID to specific collections. Employing RFID systems to supply inventory, entrance guard, and to gather reading statistics is possible. Further extensions to other collections and all kinds of materials in libraries are likely after the technology develops. The transport of power and information through radio waves, contactless auto-IDs are called radio frequency identification (RFID) systems. RFID is not a new technique. From 1980 to 1990, RFID systems gradually matured The application of RFID is similar to the application of barcodes. An RFID system employs a specific reader use radio frequency to transmit information to multiple readings from or to the tag. The function is similar to the electromagnetic strip that was used in libraries to provide on/off signals to achieve the management goal of electronic article surveillance (EAS). Librarians do not need to scan barcodes one by one. Patrons can simultaneously process check in/out, verification, and entrance guard control with RFID reader equipment. Library cards will include RFID tags.

2.1.11. Muir, Scott (2006) conducted study under the topic ***"RFID security concerns".*** This paper describes that Increasing numbers of libraries are implementing RFID solutions supplementing or replacing their existing barcode systems. While RFIDs offer many time saving benefits and productivity enhancements, they also expose libraries and their patrons to a number of potential violations of patron privacy both inside and outside the library. In an era where there is an escalating, on-going debate over libraries and patron privacy, RFIDs warrant further review. The purpose of this article is to explore the validity of some of these concerns and outline recommendations and best practices to minimize the risks to libraries and their patrons. While RFIDs offer many benefits to libraries and patrons in terms of time savings, productivity enhancements and better collection management, there are potential problems with the security of those RFIDs. Library RFIDs can contain information such as the call number or other revealing data that can help identify the item, and these RFIDs lack sufficient sec unauthorized people

from querying them. RFID patron cards open many opportunities for offering a wealth of information about individuals.

2.1.12. Hopkinson, Alan and Chandrakar, Rajesh (Nov 2005) conducted study under the title ***"Introducing RFID at Middlesex University Learning Resources".*** This paper describes that RFID technology is not new but its commercial application is quite recent because costs have reduced as the technology has matured and become more widespread. The book trade has, for some years, been interested in the application of RFID technology. It might be used by library management systems and linked to the library's item identification number by means of a table held in the database of the library management system. The identification number refers to the item's unique identifier in the library management system and is often referred to as the barcode or accession number. RFID technology has been used in libraries for a number of years. In the UK, the first installation for library circulation and security control was at the Norfolk and Norwich Millennium Library, where the TagSys system was installed in 2001. In 2002 Intellident's system was installed in the Oxford University Said Business School's Sainsbury Library in its new building. The first encounter that any Middlesex University Learning Resources staff had with RFID was at a meeting in Rome of the International Organisation for Standardisation (ISO) in May 2003 where it was reported that Danish Standards had attempted to develop standards for the selection and layout of data on an RFID chip. Later, at the IFLA General Conference in Berlin in 2003 the Information Technology section concentrated on papers related to wireless technology for library services and RFID in use. Some stands at the IFLA exhibition in 2003 were also demonstrating RFID, one of which was the Swiss Company Bibliotheca. There was only one RFID system, namely Bibliotheca, which had been developed to work with Horizon, there was no process of selection in this case. It was decided to procure four self-issue machines and to have three RFID staff circulation machines on the counter and two machines behind the counter.

2.1.13. Garfinkel, Simson (2005) conducted study under ***"Understanding RFID Technology".*** This paper presents a technical introduction to the RFID, the Electronic Product Code (EPC), and the Object Name Service (ONS). It then looks at two specific RFID applications that have been fielded over the past ten years. Early Identification Friend or Foe (IFF) systems made it possible for Allied fighters and anti-aircraft systems

to distinguish their own returning bombers from aircraft sent by the enemy. An aircraft that sends the correct signal is deemed to be a friend, and the rest are foe. Work on RFID systems as we know them began in earnest in the 1970s. Electronic Product Code (EPC) tags are a special kind of tag that follows the EPC standard developed by the MIT Auto-ID Centre and is now managed by the trade organization EPC global. It is possible to configure an RFID reader so that it sends the radio pulse only in response to an external event. On the other hand, RFID scanners are frequently equipped with triggers and power up the only when the trigger is pulled. The largest use of RFID anticipated within the next ten years is in tags to track the movement of consumer product goods from the manufacturer to the point of sale. There are some problems as well. Most organizations deploying RFID assume that serial numbers on tags can't be counterfeit (they can) and that they can't be read by competitors (they can). RFID devices have been used for identifying laboratory animals and livestock for nearly 20 years; no one is experienced in using these devices in an adversarial environment against an active attacker. Just as numerous privacy and security problems surfaced when Microsoft's Internet Explorer made its transition from the laboratory to the marketplace.

2.1.14. ***"Library Automation Using RFID"*** **(1999-2005):** This paper describes that RFID is a technology that is sparking interest in the library community because of its applications that promise to increase efficiency, productivity and enhance user satisfaction. A library stacked with books and other information dissemination processes, has a physical presence. Current library management systems use barcode technology and security strips. Using barcodes, a library management system can keep records of lending, borrowing and shelving status of items such as books, audio or video tapes, CDs, DVDs, etc. Security strips on library items tag their movements. But barcodes and security strips (electronic article surveillance or EAS) have their limitations. They are slow to read and are prone to sabotaging by thieves. RFID technology can come to the aid of library managers and users. Many libraries are switching over to RFID applications, for example, the Vatican Library. With its priceless, ancient collections of 2 million books and manuscripts, the Vatican Library is now using RFID to track, manage and secure its assets. The main problem these ancient libraries face are thefts, non-returns and mis-filed items. It provides its users the best possible facilities and access to rare manuscripts.

2.1.15. ***"Library Technology Reports"*** **(Nov/Dec2003),** is devoted entirely to the subject of RFID. This issue includes an overview of RFID technology and information about several vendors. The information about vendors is especially valuable because it is unbiased and more in-depth than some of the briefer sources available. The issue also contains an article showing the results of a survey of library administrators concerning their RFID systems. This article would be very useful to librarians considering implementing this technology because it shows how well the technology actually works, not just how the vendors say it will work. Many of the articles in this issue include Diagrams and pictures of the different components of RFID systems. Another valuable aspect of this issue is the sample RFP requirements. Many vendors provide sample RFPs on their websites, but these will show bias towards their particular system. The sample provided here is useful to project managers who have to consider all the details of implementing RFID systems. The issue also includes a list of resources and a glossary of terms. This issue of ***Library Technology Reports*** is essential to any librarian considering the implementation of RFID technology. It provides a great deal of information in one location, and this information is well documented.

2.1.16. Lindquist, Mats G. (2003) conducted study under the topic ***"RFID in libraries - introduction to the issues"***. This paper describes that new technologies have always been of interest for libraries, both for the potential of increasing the quality of service and for improving efficiency of operations. At present time, when libraries of all kinds (public, research, special) are facing economic hardships the overwhelming reason for considering new technologies is the potential for cost savings in the operations and the management of material flows. RFID is an identification technology; it does the same job as bar codes but offers potentially a lot more. The experiences of previous applications of "new" technology, bar codes and EM security, are many disappointments in the system solutions, both in the direct application of the technology and, even more so, in the systems interaction with the ILS. Since increased efficiency in operations is the primary reason for adopting new technology in Libraries there are a number of questions that must be addressed when examining the potential for RFID based systems in libraries.

2.1.17. Faber, Michael J., (Nov/Dec2002) conducted study under the title ***"RFID: The Next Tool for Managing Records?"*** In his article "RFID: The Next Tool for Managing Records?" Michael Faber examines how RFID technology can be utilized in the

management of information. Faber is Vice President of Paxton Record Retention in Springfield, Virginia. Although his article is geared towards those in the records and information field, it is not far removed from the library profession, since what librarians do is manage information. Faber provides brief information about how RFID works, and offers advantages and disadvantages of the technology. Many of the tips he offers for how to use RFID in managing records are applicable to libraries. Overall, Faber seems optimistic about the future of RFID technology. This article provides a good overview of RFID from someone who is not a librarian, thus offering a different point of view of the technology. When considering investing so much in a system, it is important to look at it from many different angles, which is how this article may be useful to librarians.

2.1.18. Coyle, Karen.(2006) conducted under the title ***"Management of RFID in Libraries"*** In this paper use of RFID and its management in libraries is discussed. It explains that RF means 'Radio Frequency' and ID means 'Identifier'. The tag in this technology consists of computer chip and an antenna. RFID is like a bar code and is read with electro-magnetic field. It is an advanced technology than barcode. It can carry more complex messages than barcode. RFID technology is not a single technology it is now used in almost every field. Libraries use new technologies because the conditions in the general environment that led to the development of the technology are also the conditions in which the library operates. RFID is a technology which has a wide variety of inventory tracking situations. Library circulation, the primary function where RFID can be used, is increasing while library budget are losing ground. RFID can be used in library anti-theft systems; this doesn't mean that it is a highly secure technology. Today's tags are often found on the inside of the book cover, barely concealed by a library label, and can be removed. The gates and their alarms are as much social deterrent as they are actual prevention. The reason to use RFID for security is not because it is especially good for it, but because it is no worse than other security technologies. There is, however, some potential savings because a single tag serves many different functions. The library saves some time in processing new items because it only has to affix one technology to the item. It may also save some money due to the integration of circulation and security with a single vendor and into a single system. In future libraries will have a combined exit-gate/check-out station that allows patrons to walk out of the library with their books in hand and their library card in their pocket.

REFERENCES

1. Palmer, Martín. (2010). Making the most of RFID in Libraries, *Emerald Journal: the Electronic Library*, 28(1), 186-188.
2. Ahsan Kamran and Shah, Hanifa (2010). RFID Applications: An Introductory and Exploratory Study, *IJCSI International Journal of Computer Science Issues*, 7(3),1-7.
3. Nambiar, Arun A. (2009), RFID technology: A review of its applications, Proceedings of the World Congress on Engineering and Computer Science (2009) Vol. II.
4. GHAHRI, Akbar and NEKOUI, Mohammad Ali (2009), *"Localization of Mobile Robots with RFID Technology and Expectation Maximization Algorithm"*, International Journal of Signal System Control and Engineering Application, Vol. 2, No. 1. , pp. 8-14.
5. MANAHER, Colleen (2008), *"Use of Radio Frequency Identification (RFID) Technology for Border Crossings"*, Privacy Impact Assessment Customs and Border Protection, RFID Technology, pp.1-27.
6. Shien-Chang Yu (2008), *"Implementation of an innovative RFID application in libraries"*, Library Hi Tech www.emeraldinsight.com/0737-8831.htm, Vol. 26. No. 3, pp. 398-410.
7. YOSHIHARA, Mariko (April 2007), *"RFID and Privacy"*, Public Law Research Institute, PLRI Working Paper Series April 2007, pp.1-15.
8. CHRISTIANA, Joseph and CIRRELLA, Nicholas(March 2007), *" Law Enforcement Response to Concerns regarding RFID Technology"*
9. PALMER, Martin (Nov 2006), *"Using RFID to transform Essex Libraries"*, Library Hi Tech News, No.10, pp. 21-22.
10. Shien-Chang Yu (2006), *"RFID Implementation and its Benefits in Libraries"*, The Electronic Library www.emeraldinsight.com/reprints, Vol. 25.No. 1, 2007, pp. 54-64.
11. MUIR, Scott (2006), *"RFID security concerns"*, Library Hi Tech www.emeraldinsight.com/0737-8831.htm Vol. 25.No. 1, pp. 95-107.
12. HOPKINSON, Alan and CHANDRAKAR, Rajesh (2005), *"Introducing RFID at Middlesex University Learning Resources"*, www.emeraldinsight.com/0033-0337.htm, Vol. 40 No. 1, pp. 89-97.

13. Data protection working party (2005), *"Working document on data protection issues related to RFID technology"* http://europa.eu.int/comm/internal_market/privacy/law_fr.htm ARTICLE-29, pp1-21.

14. GARFINKEL, Simson and HOLTZMAN, Henry (June2005), *"Understanding RFID Technology"*, garfinkel.book, pp. 15-36.

15. *"Library Automation using RFID"* (1999-2005), RFID 4U.

16. UPS Supply Chain Solutions, *"RFID in Healthcare- A panacea for the regulations and issues affecting the industry"*, United Parcel Services of America. RFID Journal. pp.1-9.

17. BOSS, Richard W. (Nov 2003), *"Library Technology Reports"*, RFID Technology for Libraries, Public Library Association Tech note.

18. LINDQUIST, Mats G., *"RFID in libraries - introduction to the issues"*, World Library and Information Congress: 69th IFLA General Conference and Council <\http://www.ifla.org.> pp.1-4

19. FABER, Michel J. (Nov/Dec2002), *"RFID: The Next Tool for Managing Records?"* Information Management Journal. Vol. 36 Issue 6, p60.

20. COYLE, Karen. (1996), *"Management of RFID in libraries"* Journal of Academic Librarianship. Vol. 31. No.5. pp.486-489

CHAPTER-3

PROFILES OF LIBRARIES

CHAPTER-3

PROFILES OF LIBRARIES

3.1. INTRODUCTION: NASSDOC

National Social Science Documentation Centre (NASSDOC), was established in 1969 as a Division of the ICSSR with the objective to provide library and information support services to researchers in social sciences; those working in academic institutions, autonomous research organizations, policy making, planning and research units of government departments, business and industry etc. NASSDOC also provides guidance to libraries of ICSSR Regional Centre and ICSSR supported Research Institutes.

3.1.2. FACILITIES AND SERVICES AVAILABLE AT NASSDOC

1. ***Library and reference service:*** This library has a rich collection of reference sources which are Bibliographies, Encyclopaedias, Doctoral Thesis, Research Project Reports and Books on social science research methodology, computer and information technology and all the major social science disciplines etc.

2. ***Bibliography on demand from Indian sources:*** This is a service provided by NASSDOC to social science research community. The requests are received from scholars living in towns or cities where documentation services are limited. Bibliography is a systematic descriptive list of published books, periodicals, articles etc. as well as unpublished Ph.D. thesis and reports on specific subjects.

3. ***Literature search from CD-ROMs/online Databases (Global Search):*** NASSSDOC has a very large and rich collection of online and CD-ROM based information sources. These are used for searching literature/references on specific topic on demand. Some of the most used online and CD-ROM databases in NASSDOC are:

i) Dissertation Abstracts on Disc(Humanities and Social Sciences)

ii) POPLINE Info
iii) LISA (Library and Information Science Abstracts)
iv) EconLit (Economics)
v) Journal Citation Report(JCR)(Social Sciences)

4. ***Acquisition of Ph.D. Theses:*** NASSDOC has a programme of acquiring copies of unpublished Ph.D. thesis in social sciences accepted by Indian Universities, and pay Rs 15,000/- to a scholar for a copy of Ph.D. thesis. A scholar is required to submit a softcopy, preferably on CD-ROM, along with a Hard copy (print version) of the thesis.

5. ***Document Delivery/ Inter Library Loan/ Reprography Service:*** Document Delivery is provided by photocopying the papers published in periodicals and through Inter Library Loan to help the scholars. NASSDOC borrows books, periodicals, reports, etc. from other libraries to meet the demands of the research scholars.

6. ***NASSDOC Databases/ Publications:*** NASSDOC creates Library Databases, Directories, Indexes, Union Catalogues, Bibliographies and information locating tools. These tools are available in Printed form/ Floppies/CD-ROMs, etc. Some of them are:

i) Bibliographic Data Bank(1), Jan.2002-Dec2004
ii) Bibliographic Data Bank(2), from 2005 onwards
iii) Directory of Social Science Research and Training Institutes in India, 2005

7. ***Current Awareness Service:*** NASSSDOC provides current awareness service by bringing out different publications at regular intervals. Moreover, photocopies of references included in the CAS publications are provided whenever there are requests from the scholars.

8. ***Grant-in-aid to Bibliographical and Documentation Projects:*** Under this scheme, NASSDOC provides financial assistance to conduct research in the field of Library and Information Science and compilation of research/reference tools for social scientists. The project proposals should fall under one of the following categories;

i) Research in the fields like Bibliometric analysis, information seeking behaviour, library users study, etc.

ii) Compilation of user's guide, directory, annotated bibliography or union catalogue etc. meant for locating information on a specific subject/topic of interest.

9. ***Continuing Education Programme:*** To familiarize the library professionals, information intermediaries and social scientists, with new techniques of information technology, and to develop specialized information skills for exploiting new systems and resources pertaining to social sciences, NASSDOC organizes short-term training workshops, seminars and lectures on regular basis under its Continuing Education Programme in different parts of the country for over 25 years.

10. Other collections: NASSDOC has a rich collection of microfilms/ microfiches and CD-ROMS of Ph.D. theses. Some of the Indian and foreign journals, working papers, union catalogues, Government Publications and other old publications are available for consultation. Documents are available for consultation in the library premises only. Borrowing facility is extended to registered members only. Printed publications are available on Inter-Library Loan. The collection is further augmented by about 450 current Indian/ foreign periodicals, including ICSSR journals and other abstracting and indexing journals in social sciences. The library has over 11,000 bound volumes of periodicals, census reports and other government publications. Some of the research project reports and theses are also available on microfilm and microfiche.

11. Well-equipped automated Library: NASSDOC is using LIBSYS Software version 4 release 6 under Windows 2000. It works in LAN. LIBSYS Software is being used for automation. Different modules used in package are:

a. Acquisition (Purchase of books)
b. Cataloguing (Organizing of documents)
c. Serial Control (Pertaining to periodicals)
d. Article Indexing (Index of selected Indian Journals)

Database can be searched by author, title, class number and keywords/subjects.

12. ***Cyber Cafe:*** ICSSR established a Cyber Cafe with an objective to provide basic communication and information technology infrastructure to social science fraternity to

access and retrieve information from electronic resources, Internet etc. It also acts as a self-learning laboratory for them.

13. ***Conference Hall:*** NASSDOC has a well-equipped Conference Hall with a capacity of 70 seats, centrally located and accessible to institutions/individuals from all over the city.

14. ***ICSSR Sales and Distribution Unit:*** To promote sale of our publications, we have a sales counter at NASSDOC. The ICSSR has been actively participating in various book fairs/exhibitions in order to enhance the circulation base of our publications for wider dissemination of social science knowledge.

3.1.3. MEMBERSHIP:

Registered members of the library can borrow books against a security deposit of Rs.500/- per book. Annual membership fee is Rs.200/-. Monthly members are required to pay @ Rs.50/- per month. There is no fee for casual readers. The library has an automated circulation system based on RFID technology.

3.1.4. FUTURE PLANS

1. To establish Microfilming unit with microfilm reader-cum-printer for researchers who want to consult thesis and research project reports.

2. To extend Library Hours on the basis of feedback received from the researchers, officials of ICSSR, government officials, students of recognized institutions.

3. To have exhaustive collection of government serial, commission and committee reports, working group reports published by Planning Commission Statistical yearbooks/abstracts published by State Statistical Bureaus etc.

4. To acquire high speed internet connection (TCP/IP Based Leased Line with a proxy server) for its cyber café and establish a gateway to Social Science.

Website: www.icsssr.org
E-mail: nassdoc@icssr.org
Source: NASSDOC Information Brochures
Address: 35, Ferozshah Road, New Delhi-01

3.2. INTRODUCTION: BCL

British Council is United Kingdom's leading cultural relation organization and India is its largest operation worldwide. It also provides education. It connects United Kingdom to the world and world to United Kingdom. It creates opportunity for people to understand each other better, work together and learns more from one another. It is crucial to build secure, more prosperous and sustainable future for us all. It provides an extensive collection, workshops, events and activities to meet the needs of the users. It serves around the clock. It is open even on Sundays and holidays also. It serves no late fees and delivers books at doors. It started RFID technology in about one and a half year ago.

3.2.1. FACILTIES

British Council has more books in collection than before. They have introduced RFID technology that takes the stress of borrowing and returning books, CDs and DVDs; Surfing o internet; listening the best British music and a coffee shop are provided to the users so that they can feel like home. They have a refreshed café Charbagh where we can enjoy delicious food also.

3.2.2. COLLECTION

1. They have a total collection of 70,000 books.
2. 34,000 latest books in a variety of subjects.

(a) **Arts and Creativity:** Architecture, Art, Decorative arts, Design, Drawing, Film and Theatre, Graphic Arts, Interior Design, Journalism and Media, Literary music, Painting, Performing Arts, Photography and Sculpture.

(b) **Business and Management:** Advertising and Public Relations, Business, Functional Management, Human Resource Management, Management, Management Applications, Marketing Sales.

(c) **Children:** Arts, Body and Health, Early Learning, Early Science, Games and Sports, General Knowledge, General Science, History, Hobbies, Junior Fiction, Language and Literature, Maths, Religion and Beliefs, Social Science, Stories and Wildlife.

(d) **English:** English Language.

(e) **Fiction:** Indian.

(f) **Fitness and Lifestyle:** Food and Drink, Healthy living, Parenting and Sports.

(g) **Knowledge and Society:** Banking and Finance, Economics, Education, Law, Philosophy and Religion and Social Science.

(h) **People and Places:** Autobiography and Biography, Geography, Historical, Travel writing.

(i) **Science and Technology**

(j) **Self Development:** *Career, Communication skills and Personality.*

3. 5,000 new books added every year.
4. 1,200 reference books.
5. 100 magazines and newspapers.
6. 5,000 DVDs, featuring the best of British cinema and Television.
7. Online access to more than 40,000 e-books across business, art, science, history, computers and more.
8. They have 35,000 tagged books in their collection.

3.2.3. OTHER SERVICES

Users can search through library catalogue where we can renew items quickly and easily and can find what is available at your nearest British Council library. Here we can subscribe to online English learning Modules.

It is designed for people who love books, music, design, sport, travel amongst other things, as well as for those who wish to improve their chances academically and professionally and want to be successful and inspired.

3.2.4. SERVICES FOR YOUNGER GENERATION

There are over 6,000 books in the collection specially designed workshops to engage young creative minds and for those children who are up to it, there is 'Summer Reading Challenge' which is a great way to get children to fall in love with the books and develop a lifelong reading habit.

3.2.5. BORROWING PROCEDURE

- Books can be borrowed for three weeks and DVDs for one week.
- Borrowed items may be renewed once, provided they have not been requested by another member.
- Overdue charges Rs.3 per day per book and Rs.10 per day per DVD/Video.
-

3.2.6. MEMBERSHIP

Category	Borrowing	New Fee	Renew Fee
Silver	Reference Membership(3months)	500	
Gold	3Books/CDs+3Periodicals	1,500	1,300
Gold Plus	3Books/CDs+3Periodicals+Ebrary	2,000	1,800
Diamond	4Books/CDs+3Magazines+3DVDs/Videos	2,800	2,600
Diamond Plus	4Books/CDs+3Magazines+3DVDs/Videos+ Ebrary	3,300	3,100
Platinum	8Books/CDs from general/children's collection+3periodicals+3 DVDs+ Ebrary	3,500	3,300

Website: www.britishcouncilonline.org
E-mail: delhi.enquiry@britishcouncil.org
Source: British Council Information Brochures
Address: British Council Library
17, Kasturba Gandhi Marg
New Delhi-01

CHAPTER-4

METHODOLOGY

CHAPTER-4
RESEARCH METHODOLGY

4.1. STATEMENT OF THE PROBLEM

The problem of the study is entitled "Use of RFID in NASSDOC and BCL, Delhi: a comparative study".

4.2. AIMS AND OBJECTIVES OF THE STUDY

The present study entitled "Use of RFID in NASSDOC and BCL, Delhi: a comparative study" primarily aims to measure the principles, policies and procedures in both the libraries. The other objectives are to know the techniques and tags etc. used in both the libraries for their security reasons.

4.3. SCOPE

The scope of this study confines to analyze the use of RFID in various sections of different libraries. This study analyses the book selection criteria and techniques used for security reasons in both the two under purview.

4.4. HYPOTHESIS

1. NASSDOC and BCL use this technology for stock in books and smart cards.

2. In NASSDOC and BCL RFID helps to reduce time for checking.

3. RFID is considered in NASSDOC and BCL as it improves their efficiency and productivity.

4. RFID has improved the circulation work of NASSDOC and BCL both.

5. NASSDOC and BCL have the facility of self-issue, self-return, and self-renewal.

6. RFID in both the libraries is user-friendly.

7. RFID system in both the libraries affect the way of working, training and development.

4.5. METHODS OF RESEARCH

A. HISTORICAL METHOD: If we are to understand our present, then history is essential. History is a written methodological record of its development and it helps to explain the present in this way.

B. SURVEY METHOD: A survey is a systematic collection of data concerning a system, its activities, operations, persons involved in that system.

C. CASE STUDY METHOD: It is a technique in which an institution is recognized as a unit of study and various aspects to the unit are studied deeply. In this method the emphasis is on principles and processes rather than transfer of factual information. It represents the real solutions drawn from practice and provides an opportunity to enquire skills in analyzing problems, making decisions and solving them.

D. DELPHI METHOD: It is basically a technique of obtaining consensus among experts opinion on a given problem. A questionnaire is prepared translating the aims and objectives of research. The identified problem is put up to the panel of experts in many rounds till a consensus agreement is achieved. The basic theory behind this technique is that consensus opinion among majority of opinions will have greater creditability and authority than the surmise of only the most articulate is a group of participating respondents.

E. STATISTICAL METHOD: It is used for aggregative analysis and intensive study of individual unit in outside its scope. This method is based upon quantitative analysis. By using this method the researcher can study the problems related to the libraries such as budget estimates, library planning, assessment of library services, evaluation of library services and library forecasting studies.

4.6. DATA COLLECTION

To conduct this study investigator took the survey methodology and to conduct the present survey a questionnaire was prepared consisting of questions pertaining to such aspects: Syntronic Gates, etc. Because the questionnaire was aimed to collect the relevant data from two libraries, so it was personally taken to these libraries.

4.6.1. SURVEY METHOD

Any survey may be a powerful and useful tool for collecting data on human characteristics, attitudes, thoughts and behavior. Knowing what the client wants is the key factor to success in any type of business. News media, government agencies and political candidates need to know what the public thinks. Associations need to know what their member wants. Large companies need to measure the attitudes of their employees. The best way to find this information is to conduct a survey.

4.6.2. STEPS IN A SURVEY

1. Establish the goals of the project- what you want to learn.
2. Determine your sample- whom you will interview.
3. Choose interview methodology.

a) Create your questionnaire.

b) Pre-test the questionnaire.

c) Conduct the interviews and enter data.

d) Analyze the data.

4.6.3. METHODS USED IN SURVEY STUDIES

1. Observation method
2. Interview method
3. Documentary method
4. Questionnaire method

i) Observation Method

It is a systematic viewing, coupled with consideration of the seen phenomena in which main consideration must be given to the larger unit of activity by which the specific observed phenomenon occurred.

This method implies the collections of information by way of the investigators own observation, without interviewing the respondent. In this method we observe things ground us. It is well established method for data collection. It is method of testing, characterizing human behavior.

ii) Interview Method

It is a systematic method by which a person enters more or less imaginatively into the life of comparative strangers. It is more direct and has greater flexibility.

Interview methods are of following types: -

- **Personal Interview**
- **Telephonic Interview**
- **Personal Interview:**An interview is called personal when the interviewer asks the questions face-to-face with the interviewee. Personal interviews can take place in the home, at a shopping mall, in the street, outside a movie theater or polling place etc.
- **Telephonic Interview:** Surveying by telephone is the most popular method in developed countries like U.S.A. In this method interviewer asks the questions over a telephone line with the interviewee.

iii) Documentary Method

Through this method the investigator make use of many documents are second, published or unpublished to extract information document is very important, dependable and valuable source of information which is record that contains important information about a problem under investigation.

iv) Questionnaire Method

Questionnaire is a format list of questions, especially as used in an official enquiry. It is constructed translating the aims and objectives of the survey study. This method is known as heart of survey studies.

In general there are two types or format of questionnaire:-

a) Open Questionnaire: In this questionnaire there are no predetermined set of responses, and the respondent is free to give answers to the questions in his/her own words.

b) Closed Questionnaire: They are easy for the respondent. There is no clear consensus on the number of options that should be given in a closed format questionnaire. In this questionnaire answer is given in front of question. The respondent has to select the alternate answer written against the question. In other words the respondent has to tick out correct answers.

4.7. TOOLS USED FOR STUDY

This study used Questionnaire method to collect data from the respondents as many similar studies conducted earlier have also used this method for data collection. Besides questionnaire, the investigator applied observation and informal introduction to collect data from the respondents.

4.8. SAMPLE POPULATION

This survey is conducted on sample of two chief librarians of NASSDOC and BCL. Both responses were obtained and used for further analysis.

4.9. VARIABLES TAKEN

In order to achieve the objective of the study and get meaningful conclusion mainly one variable is taken for detailed analysis:

- ❖ Librarian of NASSDOC.
- ❖ Librarian of NASSDOC and BCL.

4.10. SCOPE

The scope of the present study is only concerned with the librarians of NASSDOC and BCL.

4.11. PILOT SURVEY

Study preceding the main study usually to check the viability of the study design is known as Pilot Survey. It was taken to undertaken to ensure that questionnaire was as meaningful to respondents as they were to investigator and to decide which questionnaires were relevant and the purpose of the study. So a pilot survey was done which was useful in modifying the questions properly.

4.12. DATA ANALYSIS

Data collected through questionnaire, observation and informal are organized and tabulated by using statistical method, tables and percentage.

CHAPTER-5

DATA ANALYSIS AND INTERPRETATION

CHAPTER -5

DATA ANALYSIS AND INTERPRETATION

1. ***Designations:***

NASSDOC	Director
BCL	Library Manager

In NASSDOC the highest designation is of Director whereas in BCL the highest designation is of Library Director.

2. ***RFID is used in the following:***

	NASSDOC		**BCL**	
	Yes	No	Yes	No
Books	√		√	
Audio Visual		√	√	
Smart Cards	√		√	
Smart Cards including electronic cash		√		√

In NASSDOC RFID is used in only books and smart cards.

In BCL RFID is used in books, audio visual and smart cards.

Therefore BCL use RFID in almost all its fields.

3. ***RFID considers to:***

	NASSDOC		**BCL**	
	Yes	No	Yes	No
Identify Book Position		√	√	
Prevent Theft		√	√	
Prevent Misuse		√		√
Eliminate human Error		√	√	
Reduce Time For Checking	√		√	

In NASSDOC RFID considers reducing time for checking.

In BCL RFID considers identifying book position, preventing theft, eliminating human error and reducing time for checking.

So in NASSDOC RFID is considered only for reducing the time whereas BCL RFID considers identifying book position, preventing theft, eliminating human error and reducing time for checking.

4. NASSDOC & BCL considers RFID to:

	NASSDOC		BCL	
	Yes	No	Yes	No
Improve efficiency		√	√	
Improve productivity		√	√	
Reduce operating costs		√		√
Reduce labor costs		√	√	
Required by supplier	√		√	

BCL considers RFID to improve efficiency, improve productivity, reduce labor costs and it is required by supplier.

Though both NASSDOC and BCL are important and are required by supplier but NASSDOC considers RFID because of only one feature whereas BCL considers RFID because of many features.

5. Knowledge of read- range of RFID:

	NASSDOC		BCL	
	Yes	No	Yes	No
Tags	√		√	
Security gates		√	√	
Check -out	√			
Check- in	√			

NASSDOC has the knowledge of read range of RFID tags, check out and check in.

BCL has the knowledge of read range of RFID tags and security gates.

NASSDOC has the knowledge of read range of RFID tags, check out and check in whereas BCL has the knowledge of read range of RFID tags and security gates also.

6. Tags they require:

	NASSDOC		BCL	
	Yes	No	Yes	No
Not sure		√		√
Read only		√		√
Read & write once		√	√	
Reusable read or write	√			√

NASSDOC use reusables read or write tags.

BCL uses read and write once tags.

NASSDOC requires reusable read or write tags whereas BCL requires read and write once tags.

7. They need tags or labels:

	NASSDOC		BCL	
	Yes	No	Yes	No
Tags	√		√	
Labels		√		√
Not sure		√		√

NASSDOC need tags instead of labels.

BCL also need tags instead of labels.

Both BCL and NASSDOC need tags instead of labels.

8. Tags contain personal data and include ISBN:

	NASSDOC		BCL	
	Yes	No	Yes	No
Personal data		√		√
ISBN		√		√

In NASSDOC tags do not contain personal data and does not include ISBN.

In BCL also tags do not contain personal data and does not include ISBN.

So in NASSDOC and BCL tags do not contain personal data and does not include ISBN.

9. Hand held device affect staffing:

	NASSDOC		BCL	
	Yes	No	Yes	No
Stock taking		√	√	
Stock tiding		√	√	
Locating requests		√	√	

In NASSDOC hand held device does not affect on staffing in stock taking, stock tiding and locating requests.

In BCL hand held device affect on staffing in stock taking, stock tiding and locating requests etc.

Hand held device does not affect on staffing in NASSDOC in any of the feature which are stock taking, stock tiding and locating requests but it affect staffing of BCL on all these features.

10. Self service cater for

	NASSDOC		BCL	
	Yes	No	Yes	No
Self issue	√		√	
Self return	√		√	
Self renewal	√		√	
Enquiries	√			√
Reservations	√			√
Information with security gates		√	√	
Management information	√			√
Anti-Virus Protection		√		√
Documentation	√			√

Self service in NASSDOC as well as in BCL in BCL caters for self issue, return and self renewal.

But in addition to these aspects BCL has one more feature which is information with security gates.

Whereas NASSDOC has some more features in addition to it which are enquiries, reservations, management information and documentation.

11. RFID helps NASSDOC and BCL to improve their service to customers:

	NASSDOC		BCL	
	Yes	No	Yes	No
Self service	√		√	
Return	√		√	
Extend opening hours	√		√	
Unsatisfied service points		√	√	
Security		√	√	
Improved ease of use	√		√	
Alternative way of presenting stock		√		√
Navigating the library		√		√

RFID helps NASSDOC to improve their service to customers in self service, self return, extending opening hours, and improved ease of use.

RFID helps BCL to improve its service to customers in self service, self return, extending opening hours, unsatisfied service points, security and improved ease of use.

In terms of services given to customers RFID helps both NASSDOC and BCL in self service, self return, extending opening hours and improved ease of use but it helps BCL in more services which are unsatisfied service points and security also.

12. Do they know how tags data are structured and do them contain data or not?

	NASSDOC		BCL	
	Yes	No	Yes	No
Structure	√		√	
Data	√		√	

NASSDOC knows the structure of tags and they contain data also.

BCL also knows the structure of tags and they contain data also.

Both NASSDOC and BCL know the structure of tags and they contain data also.

13. Do they have RFID customer cards & they contain personal data?

	NASSDOC		BCL	
	Yes	No	Yes	No
Customer Cards	√			√

NASSDOC has RFID customer cards containing personal data.

BCL does not have RFID customer cards which contain personal data.

NASSDOC has RFID customer cards but BCL does not have RFID customer cards.

14. Will RFID affect:

	NASSDOC		BCL	
	Yes	No	Yes	No

Ways of working/ work culture	√		√	
Job Profiles/Structure	√		√	
Training/Development	√		√	

In NASSDOC RFID will affect ways of working/ work culture, job profiles/ structure and training/ development.

In BCL also RFID will affect ways of working/ work culture, job profiles/ structure and training/ development.

In NASSDOC as well as BCL RFID will affect ways of working/ work culture, job profiles/ structure and training/ development.

CHAPTER-6

FINDINGS, CONCLUSION AND SUGGESTIONS

CHAPTER-6
FINDINGS, CONCLUSION AND SUGGESTIONS

5.1. FINDINGS:

The hypothesis formulated in chapter 4 was put to test on the basis of collected and analyzed data as given below:

HYPOTHESIS-1

NASSDOC and BCL use this technology for stock in books and smart cards

Table-2 shows that RFID in NASSDOC and BCL is used for stock in books and smart cards.

The hypothesis is proved true.

HYPOTHESIS-2

In NASSDOC and BCL RFID helps to reduce time for checking.

The raw data which is given in table-3 shows that NASSDOC and BCL both considers RFID as it reduce the time of staff in checking.

This hypothesis is proved positive.

HYPOTHESIS-3

RFID is considered in NASSDOC and BCL as it improves their efficiency and productivity.

Table-4 shows that both NASSDOC and BCL consider RFID because it improves their efficiency and productivity.

This hypothesis is proved positive.

HYPOTHESIS-4

RFID has improved the circulation work of NASSDOC and BCL both.

Table-11 shows that RFID helps NASSDOC and BCL in their circulation work and also improved its work as both the libraries has extended their time of service. These libraries are providing self-service improving their circulation work.

So, this hypothesis is proved positive.

HYPOTHESIS-5

NASSDOC and BCL have the facility of self-issue, self-return, and self-renewal.

In Table-10 it is given that both NASSDOC and BCL are providing the facilities like self- issue, self-return and self-renewal.

So, this hypothesis is proved.

HYPOTHESIS-6

RFID in both the libraries is user-friendly.

Table-10 and 11 shows that RFID has improved much work like self- issue, self-return and self-renewal. Both the libraries has also extended the opening hours improving much work. It shows that RFID is much user- friendly in NASSDOC and BCL.

This hypothesis is proved.

HYPOTHESIS-7

RFID system in both the libraries affect the way of working, training and development.

Table-14 shows that in NASSDOC as well as BCL RFID will affect the ways of working/working culture, job analysis/structure and structure and training and development.

So, this hypothesis is proved.

5.2. CONCLUSION

On the basis of the study made some conclusions were drawn:

1. Both the libraries NASSDOC and BCL use this technology for stock in books and smart cards.

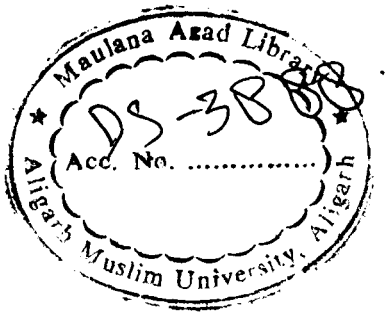
   But when we compare use of RFID by NASSDOC to BCL we come to know that BCL use this technology in Audio visual also.
2. In terms of considering RFID, it helps both NASSDOC and BCL to reduce their time for checking.

   But in this also RFID helps more to BCL as it helps to identify book position and also to eliminate human error.
3. NASSDOC and BCL consider RFID because it improves their efficiency and productivity both.
4. In case of work or service given to customers RFID helps both in their circulation work equally i.e. self-service, return, extending opening hours and making work easy.
5. In terms of self service RFID helps BCL more than NASSDOC because BCL has self services like self-issue, self-return, self-renewal and also information with security gates but NASSDOC has only self- isssue, self-return and self-renewal service.
6. In both the libraries NASSDOC and BCL, RFID is user friendly because it helps its users as it has various self services.
7. When the name of software comes in our mind it is concluded that both NASSDOC and BCL use LIBSYS software.
8. RFID when it makes the work easy for both users as well as of staff., it affect the way of working/ work culture, job profiles/ structure and training and development. All this work is affected in same way in NASSDOC as well as in BCL.

5.3. SUGGESTIONS:

While making conclusions there are some points which need to be improved.

1. Both the libraries are using RFID technology and are working on LIBSYS software. So, it is necessary that both of them should have some anti-virus protection.
2. Though both the libraries has all the work electronically but it is necessary that NASSDOC and BCL should some alternative way to present the stock as well as computer is a machine and can create problem at any time which can waste the time of staff as well as of users.



Bibliography

1. Kataria, Sanjay and Nigam, B.S., *Emerging trends and technologies: An overview of library and information services.*
2. Aswal, R.S. (2006), *Library Automation for the 21st Century,* 216-217.
3. Pattanaik, Babita and Pattanaik, Bibhuti Bhusan (2008), RFID: An issue for Indian Libraries, *Libraries in Digital Environment: Problems and Prospects,* 284.
4. Sripriya, S. (2006) RFID Technologies for libraries in Digital Scenario, *Library Automation for the 21st century,* 271-273.
5. Shien -Chang Yu (2007) RFID implementation and benefits in libraries, *the electronic library,* 25(1), 54-64.
6. http://msdn.microsoft.com/canada/rfid/.
7. www.emeraldinsight.com/0033-0337.htm
8. RFID Journal (2003), *"ISO Moves on RFID Standards"*, RFID Journal. http://www.rfidjournal.com/article/articleprint/297/-1/1/
9. http://www.icssr.org/doc_intro.htm
10. http://www.britishcouncilonline.org
11. Library Hi-tech (1997), Systems security in the networked library, *Library Hi-Tech,* 12 (1-2).
12. Wary, G. (2006), *"Turning into Radio Frequency Identification (RFID)".*
13. http://www.library.useek.ca/engin
14. http://www.rfidwizard.com
15. Mishra, R.N. and Panda, K.C. (2008) Perspective of Library services with RFID technology, *Libraries in Digital Environment: Problems and Prospects,* 261.

THE DEPARTMENT OF LIBRARY & INFORMATION SCIENCE
ALIGARH MUSLIM UNIVERSITY, ALIGARH (U.P.)

Respected Sir/Madam,

I am conducting a survey on **"Use of RFID in NASSDOC & BCL, Delhi"**, A comparative study for my M.L.I.Sc. Dissertation work under the supervision of:
Mrs. Nishat Fatima (Sr. Lecturer), Department of Library Science, AMU, Aligarh (U.P.)

QUESTIONNAIRE

Q. No	ATTRIBUTES		YES	NO
1	Name of the Library:			
2	Designation of the librarian			
3	Do you have RFID technology in your library?			
4	Is your institution making any arrangements for RFID?			
	If Yes , please specify:			
5	Do you think RFID is essential for every library?			
6	What is your purpose to use RFID for :			
	a) Stock:	i) Books		
		ii) Audiovisual		
	b) Users:	i) Smart cards		
		ii) Smart cards including electronic cash		
7	RFID helps to:	i) Identify book position		
		ii) Prevent theft		
		iii) Prevent misuse		
		iv) Eliminate human error		
		v) Reduce time for checking		
8	Do you need to ensure that any resulting changes conform to policies your parent organization (local authority, university etc.) may have for:			
		i) ICT		
		ii) Human Resources		
		iii) Finance		
		iv) Procurement		
9	Explain the reason you are considering RFID:	i) Improve efficiency		
		ii)Improve productivity		
		iii) Reduce operating costs		
		iv) Reduce labor costs		
		v) Required by supplier		

Q. No	ATTRIBUTES		YES	NO
10	What locations will utilize the RFID solution?	i) Single facility		
		ii) Multiple regional facilities		
		iii) Multiple national facilities		
		iv) Multiple global facilities		
		v) Barcode better than RFID?		
11	Do you know the read range of:	i) Tags		
		ii) Security Gates		
		iii) Check-out		
		iv) Check-in		
12	What type of tags will you require:	i) Not Sure		
		ii) Read Only		
		iii) Read & write once		
		iv) Reusable read or write		
13	Do you need tags or labels?	i) Tags		
		ii) Labels		
		iii) Not sure yet		
14	Will tags contain any personal data?			
15	Will tag data include ISBN?			
16	How will it affect staffing and procedures?			
	a. Stock Management:	i) Circulation		
		ii) Editing		
	b. Automatic sorting:	i) All Stock for shelving		
	c. Acquisition (internally):	i) Tagging of all new stock		
		ii) Review of stock processing(bar codes)		
		iii) Effect on delivery points		
	d. Acquisition (externally): Review of supply chain implications			
	e. Handheld device for:	i) Stock taking		
		ii) Shelf tiding		
		iii) Locating requests etc		
	f. Culture change:	i) Staff Roles		
		ii) Job Profiles		
		iii) Structures		
17	Is RFID not being used for security, so how it interacts with security?			

Q. No	ATTRIBUTES		YES	NO
18	Do the self service cater for?	i) Self Issue		
		ii) Self Returns		
		iii) Self Renewal		
		iv) Enquiries		
		v) Reservations		
		vi) Integration with security gates		
		vii) Management information		
		viii) Anti-virus protection		
		ix) Documentation		
19	How will you use RFID to help to improve your service to customers?			
		i) Self Service		
		ii) Return		
		iii) Extend Opening Hours		
		iv) Unsatisfied service points		
		v) Security		
		vi) Improved ease of use		
		vii) Alternative way of presenting stock		
		viii) Navigating the library		
		If Yes, then how?		
20	Do you know how tag's data is structured?			
21	Tags hold more data or not?			
22	Does the system is user friendly?			
23	Does the system produce receipts?			
24	Do you have RFID customer cards & will they contain any personal data?			
	If Yes, then specify:			
25	Do you have a plan for monitoring the effectiveness of RFID?			
26	Will RFID affect:	i) Ways of working/ work culture?		
		ii) Job profiles / structure?		
		iii) Training / Development?		
		If Yes, then please specify		
27	Does RFID need to link two buildings?			
	If Yes, then please specify:			
28	Do you know how much staff training is needed?			
Any suggestions that you would like to give:				

Thank you for your valuable feedback...